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system. In particular, this model addresses the following methods for specifying a location:

[0254] **RCLink.** An RCLink is the standard method that GDOT currently uses to identify a location in which a RCLink name and milepoint offset along that RCLink specifies a road location.

[0255] **Traversal.** A Traversal is a generic method for supporting street names and milepoint offsets along the streets. RCLink is a special case of a traversal, but other classes of traversal (e.g., street names, interstate numbers) are possible.

[0256] **Milepost.** Milepost locations provide an alternative other than milepoints for specifying offsets along traversals.

[0257] **Address.** Address ranges provide an alternative other than milepoints for specifying offsets along traversals.

[0258] **Relative References.** Relative references provide a method for specifying a location relative to a known location. Mileposts are a special case of a relative reference.

[0259] **Area Reference.** An Area Reference refers typically to a jurisdictional area. Road Attributes are maintained for several types of jurisdictional areas identifying the jurisdictional area in which a road lies (e.g., for counties, for maintenance districts). These jurisdictional road Attributes can be used to identify locations.

[0260] **Geographic Reference.** A Geographic Reference refers to a map reference. For instance, in the map interface, users can identify locations by clicking on

points or selecting rectangular regions of the map. These geographic references are resolved into road locations by selecting either the closest road position for a point reference or the set of road sections contained inside the rectangle for a rectangular reference.

5 **[0261]** In the exemplary system, all road locations are expressed internally as either Road Sections with offsets or as Division Sections with offsets. Thus, a location referencing method is a definition of how to convert between some reference data (e.g., RCLink name and milepoint) and a Road Section or Division Section and offset.

10 **[0262]** Referring now to Figure 16, there is a depiction of the types of location reference conversions that are part of the data model. In this figure, two-headed arrows indicate that conversion both ways is supported between a location referencing method and the internal Anchor/Road Section location referencing method. A one headed arrow indicates that the conversion works only from a location reference to the
 15 internal location referencing method. For instance, Anchor Section and Offsets 1601 is connected with Road RCLink and Milepost 1602 with a two-headed arrow. Thus, conversion is supported both ways. Anchor Section and Offsets 1601 is connected with Geographic References 1603 via a one-headed arrow. Thus, conversion from a Geographic Reference to an Anchor Section and Offset is supported, but not vice-a-
 20 versa.

[0263] Specifically, those conversions that are supported in both directions are: Road RCLink and Milepost 1602 to/from Anchor Section and Offsets 1601 and Road

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Section and Offsets 1620; Road RCLink and Milepoint 1605 to/from Anchor Section and Offsets 1601 and Road Section and Offsets 1620; Traversal and Milepoint 1611 to/from Anchor Section and Offsets 1601 and Road Section and Offsets 1620;

Traversal and Milepost 1613 to/from Anchor Section and Offsets 1601 and Road

- 5 Section and Offsets 1620; and Traversal and Address to/from Anchor Section and Offsets 1601 and Road Section and Offsets 1620. Those conversions that are supported only in one direction are: Relative Reference 1607 to Anchor Section and Offsets 1601 and Road Section and Offsets 1620; Geographic Reference 1603 to Anchor Section and Offsets 1601 and Road Section and Offsets 1620; and Area
- 10 Reference 1609 to Anchor Section and Offsets 1601 and Road Section and Offsets 1620. It will be apparent to one skilled in the art how to implement each of these conversions.

The Data Maintenance Model

- 15 [0264] The TSAF database is a complex structure that includes many interactions between the elements that comprise the database. For example, road Attributes are stored via dynamic segmentation related to percentage offsets along the Division Sections. Thus, any change to a Division Section has the potential to also affect every road Attribute stored along the Division Section. This dependency
- 20 extends far beyond this single example: Road Sections depend on Division Sections, many maps depend on road Attributes, traversals depend on Division Sections, etc.